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PRE-APPEAL BRIEF REQUEST FOR REVIEW		Docket Number (Optional) 20239/0204318-USO	
		Application Number 10/599,036-Conf. #3301	Filed September 18, 2006
		First Named Inventor Teruo Amoh et al.	
		Art Unit 2894	Examiner A. Belousov
<p>Applicant requests review of the final rejection in the above-identified application. No amendments are being filed with this request.</p> <p>This request is being filed with a notice of appeal.</p> <p>The review is requested for the reason(s) stated on the attached sheet(s). Note: No more than five (5) pages may be provided.</p> <p>I am the</p> <p><input type="checkbox"/> applicant /inventor.</p> <p><input type="checkbox"/> assignee of record of the entire interest. See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96)</p> <p><input checked="" type="checkbox"/> attorney or agent of record. Registration number <u>59,233</u></p> <p><input type="checkbox"/> attorney or agent acting under 37 CFR 1.34. Registration number if acting under 37 CFR 1.34. _____</p> <p> _____ Signature James C. Signor _____ Typed or printed name</p> <p>(212) 527-7700 _____ Telephone number November 17, 2009 _____ Date</p> <p>NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below*.</p> <p><input type="checkbox"/> *Total of <u>1</u> forms are submitted.</p>			

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

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In re Patent Application of:  
Teruo Amoh et al.

Application No.: 10/599,036

Confirmation No.: 3301

Filed: September 18, 2006

Art Unit: 2894

For: SEMICONDUCTOR LIGHT EMITTING  
ELEMENT MOUNTING MEMBER, AND  
SEMICONDUCTOR LIGHT EMITTING  
DEVICE EMPLOYING IT

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Examiner: Alexander Belousov

**PRE-APPEAL BRIEF REQUEST FOR REVIEW**

MS AF  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Dear Sir:

In accordance with the Pre-Appeal Brief Conference Program, Applicants hereby request a pre-appeal brief panel review of the final Office Action mailed July 23, 2009 in the above-identified patent application. The present Request is filed concurrent with the filing of a Notice of Appeal and before the filing of an Appeal Brief. No amendments are being filed with this Request. Review is requested for the following reasons.

**I. THE EXAMINER HAS FAILED TO ESTABLISH A PRIMA FACIE CASE OF  
OBVIOUSNESS WITH RESPECT TO CLAIM 1.**

**A. Background**

Claims 1, 3, 4 and 6-13 are pending in the present application. Claims 1, 3, 4 and 7-13 have been rejected under 35 U.S.C. § 103(a) as obvious over Japanese Laid-Open Application No. JP 2002-127948<sup>1</sup> by Ishii et al. ("Ishii"). Claim 6 has been rejected under 35 U.S.C. § 103(a) as obvious over Ishii in view of U.S. Patent Application Publication No. 2002/0171087

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<sup>1</sup> All citations are to the U.S. counterpart to Ishii, U.S. Patent Application Publication No. 2005/0167679.

by Krames et al. ("Krames").

The present invention is a semiconductor light-emitting element mounting member having enhanced reflectivity and therefore light-emission efficiency. The inventors have found that enhanced reflectivity can be achieved by controlling two parameters in the metal layer which reflects the light. Specifically, the metal layer (i) has a center-line average roughness Ra of no more than 0.1 microns, and (ii) contains crystals grains of silver, aluminum or an alloy thereof along a surface plane of the metal film, where the grains have a particle diameter of no more than 0.5 microns.

While Ishii fails to disclose particle diameter or center-line average roughness for a metal film, the Examiner contends that it would have been obvious to modify Ishii to have such crystal grains and roughness in order to prevent formation of gaps between the sub-mount and chip mounted on it. See Final Office Action dated July 23, 2009, Page 4.

**B. Ishii does not disclose or suggest a metal film with an average roughness of no more than 0.1  $\mu\text{m}$ .**

Ishii and the present invention include a substrate as a base layer on which one or more metal films may be formed. Ishii describes that the substrate has an average roughness Ra of at most 1  $\mu\text{m}$  (preferably at most 0.1  $\mu\text{m}$ ) and a flatness of at most 5  $\mu\text{m}$  (preferably at most 1  $\mu\text{m}$ ), but is silent as to any roughness or flatness of metal films. See Ishii, paragraph [0058]. The Examiner, however, contends that it would have been obvious to use these specifications of the substrate for the metal films as well based on the Japanese Industrial Standards mentioned in Ishii. It is respectfully submitted that the Examiner has misinterpreted the Japanese Industrial Standards mentioned in Ishii.

The Japanese Industrial Standards JIS B 0601 and JIS B 0621 merely provide a standard definition for average roughness Ra and flatness, respectively. See Ishii, paragraph [0058]. In other words, the standards do not set forth, for example, a required roughness for a substrate of a semiconductor device as it appears the Examiner has interpreted them, but rather set forth general measurement methods for determining the roughness and flatness of a surface. Thus, contrary to the Examiner's contentions, there is no "default" standard or requirement for surface

roughness and flatness which can be substituted for the unspecified roughness and flatness of the metal layer of Ishii. See Final Office Action dated July 23, 2009, Page 4. Likewise, there is no "strict standard on surface roughness and diameter" which can be applied to more layers. See Final Office Action dated July 23, 2009, Pages 4-5.

C. Ishii does not disclose or suggest particle diameter of no more than 0.5  $\mu\text{m}$  for the metal or alloy.

The Examiner contends that paragraph 58 of Ishii specifies the particle diameter of the substrate. See Final Office Action dated July 23, 2009, Page 3. However, as discussed above, Ishii only describes the flatness and average roughness of the substrate. See Ishii, paragraph [0058]. In addition to improperly applying properties of the substrate to the metal layers as mentioned above, it is respectfully submitted that the Examiner has also improperly correlated flatness and/or average roughness to the particle diameter of the metal or alloy in the metal film.

Independent claim 1 recites that the metal film is formed from crystal grains with a particle diameter of no more than 0.5  $\mu\text{m}$ . Generally, smaller particle size and a smoother surface decrease diffuse reflection of light on a metal film. However, flatness and roughness are not necessarily related to particle size since flatness refers to the degree to which an entire surface varies from a horizontal plane and average roughness Ra is taken across an entire surface. Accordingly, a surface may include some crystal grains of a large diameter and still be relatively flat and smooth. Thus, even though the surface may have a low average roughness, the presence of some crystal grains with a large diameter would increase diffuse reflection of light. On the other hand, a surface formed of only small diameter crystal grains could have a high average roughness, for example, if the surface is a rolling surface or has asperities. This high average roughness would also increase diffuse reflection of light. Thus, both a particular particle diameter and average roughness are necessary to achieve decreased diffuse reflectivity and particle diameter cannot be determined from flatness and average roughness which generally describe an entire surface.

Moreover, Ishii does not disclose or suggest any criticality to the center-line average roughness Ra of the metal layer, or the size of crystal grains of silver, aluminum, or an alloy thereof along its surface plane. Additionally, Ishii does not teach that the surface properties of the metal layer should be controlled in any manner. Rather, Ishii teaches a solder layer positioned below the laser diode and attached thereto by melting. See Ishii, paragraph 83. Accordingly, the reflective metal layer is formed without controlling the particle size of any crystal grains which may form. Ishii also does not disclose or suggest any subsequent modification of its solder layer. Krames is likewise silent as to controlling particle diameter of crystal grains in a metal film and therefore does not remedy this deficiency.

Thus, since Ishii fails to disclose or suggest a particle size for crystal grains in the metal film, it can not render claim 1, or any of its dependent claims 3, 4, and 6-13, obvious. Reconsideration and withdrawal of the rejections to claims 1, 3, 4 and 6-13 under 35 U.S.C. § 103(a) is therefore respectfully requested.


**CONCLUSION**

For the foregoing reasons, Applicants respectfully request a review of the rejection of all of the pending claims, and the withdrawal of these rejections under 35 U.S.C. § 103(a).

The Commissioner is hereby authorized to charge any unpaid fees deemed required in connection with this submission, including any additional filing or application processing fees required under 37 C.F.R. 1.16 or 1.17, or to credit any overpayment, to Deposit Account No. 04-0100.

Dated: November 17, 2009

Respectfully submitted,

By 

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